

Light and Lighting

Industrial, Commercial, Highways, Domestic, etc.

Vol. XLV.—No. 1.

JANUARY, 1952

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“Perfect Illumination”

“PERFECT illumination is only writing made lovely.” Readers of this Journal may momentarily experience some astonishment at this definition given by Ruskin for, nowadays, even those who are unversed in matters of lighting generally think of “illumination” as “light,” and hardly ever as coloured decoration of manuscripts. We cannot speak in modern technical terms of “perfect illumination,” and, realising that perfection is unattainable, we do not even speak of “perfect lighting”; though, speaking editorially, we are strong advocates of “good lighting.” To Ruskin, who was not ignorant that illumination means light—and who was perhaps the first to use the expression “the science of seeing”—“perfect illumination” meant, in its “light” sense, the light of the sun: “*Sol illuminatio nostra est; Sol salus nostra; Sol sapientia nostra.*” To us, “good lighting” means this, but not this alone: for, to-day, artificial lighting also can be good. And so it is in numerous places, but not yet in nearly enough of them.

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Notes and News

How to Write a Paper

The 1951 volume of the I.E.S. Transactions consists of only nine issues instead of the usual ten and is one of the thinnest volumes for some time. What it lacks in quantity, however, it makes up in quality which has been steadily improving during the last few years. Even so, the I.E.S. Papers Committee are, no doubt, concerned about the lack of material put forward for publication for, though there are still limits imposed largely by present-day costs on the amount of material that can be published, a good and regular supply of material is what is required. Every alternate year the Summer Meeting provides a number of extra papers, and the 1952 volume will probably be quite a substantial one.

The Papers Committee have naturally always been concerned with the quality of material submitted for presentation at meetings and for publication, and they recently issued a revised version of their recommendations to authors on the submission of MSS. This brief document deals with the main points on layout, length, illustrations and such matters, and has already, we gather, had some effect. Compliance with these recommendations is of great help both to the editor and to the author; the editor, whose appointment is of the acting-unpaid variety, is saved a lot of work, and the author is

assisted in saying what he has to say in the right way in the first instance and saved a lot of unnecessary amending and rewriting at a later stage.

It is not everyone who has the inclination to write a paper, but there are quite a number who have thought of it or who have considered bursting into print in one form or another and who do not quite know how to go about it. It is to help these and at the same time to provide an amusing and instructive evening for other I.E.S. members that the I.E.S. have arranged for an informal meeting to be held on January 23 at which the "behind-the-scenes" work which goes into the preparation and presentation of a technical paper will be dealt with dramatically by means of a series of sketches. Recent visitors to 32, Victoria-street may have noticed the somewhat eccentric behaviour of some members of the staff

Next I.E.S. Meeting in London

The next I.E.S. Sessional Meeting in London is to take place at the Royal Society of Arts, John Adam Street, W.C.2, at 6 p.m., on Tuesday, January 8.

At this meeting a paper entitled "Control of Light by a Lighthouse Lens" is to be presented by Dr. W. M. Hampton. The paper opens with a brief discussion of the conditions to be fulfilled by a lighthouse lens, and goes on to deal with the conspicuity of such lights. Methods of computing the range of a lighthouse beam are given, and the practical application of recent studies is given.

who have developed a habit of muttering under their breath to the accompaniment of dramatic gestures and cynical laughter; they are not practising with a view to applying for any of the vacancies with the Old Vic Company but are merely dramatising their own daily routine for the parts in the forthcoming "technical morality in six morals." And just as the staff are to play themselves so are the members of the Papers Committee who after the play will invite criticism of their behaviour

(not as actors, but as a committee) from the audience. Other victims include a budding author who makes good, the editor and others such as sundry wives who have to suffer in the cause of the I.E.S.

This informal meeting has all the makings of an enjoyable evening, and we would thoroughly recommend it to all who feel that I.E.S. meetings are normally too formal, to those who want to know how to set about writing a paper, to those who don't want to know but who enjoy the suffering of others—in fact we recommend it to all. The meeting is to take place at 6 p.m. in the Lecture Theatre of the General Electric Co., Ltd., Magnet House, Kingsway, W.C.2, on January 23.

The Building Research Congress

Many who could not attend the recent Building Research Congress may wish to buy the books containing the papers presented in the three Divisions of the Congress. The papers are published in three volumes, one for each Division, and are obtainable, price 22s. 6d. each, or 50s. for the set of three, from the Organising Secretary, Building Research Congress, 1951, Building Research Station, Garston, Watford, Herts, and early application is desirable. Members of the participating bodies (which includes the I.E.S.) of the Congress may obtain single books at 17s. 6d. each.

The Division 1 book contains papers on building techniques, structural matters, and soil mechanics; Division 2 book contains papers on building materials, and Division 3 book deals with acoustics, heating and ventilating, lighting, and with problems of hospitals, factories and schools. The three books together present an up-to-date picture of the present position of building research.

The record of discussion which took place at the technical sessions of the Congress may be ordered now in advance of publication, price 25s. (20s. to Congress members).

I.E.S. members may order direct from

the address given above, mentioning their membership of the Society, or they may order through the I.E.S. Secretary.

Retrospect and Prospect

As has been our practice in recent years we include in this first issue of the New Year a review of developments and progress in the lighting field during the year just ended. We think readers will find Mr. Beseme's comments as instructive and as entertaining as we do. Although the lighting industry is always looking to the future these reflections of our recent activities are most useful; this is particularly so in regard to Mr. Stevens's article on the lighting of the South Bank Exhibition. A year ago most of us thought that the 1951 Exhibition would give us a grand opportunity to show what we could do, but it is clear from comments which have been made from time to time, in this journal and elsewhere, that though many things were well done there were also many things which could have been better and that we still have many lessons to learn. It is of the lessons to be learned that Mr. Stevens writes; possibly other readers could mention others in which case we would be glad to hear of them.

The subject of home lighting is one on which most lighting engineers have some views, but we have found it very difficult to get anything constructive on to paper. We were most interested, therefore, when we saw the house which is illustrated on pp 18-21 of this issue, and feel sure that there are many lighting engineers and architects who will be interested to see what can be done in a new house if a little effort is taken at the drawing-board stage. The pictures we have reproduced do not do justice to the results, which we thought were excellent. This article, however, shows what can be done with a new house; the problem of the old house is a different matter, but we may have something to say about this in the near future. We should be glad to have the comments of readers on lighting in the home.



*Floodlighting to enhance the interior
of King's College Chapel, Cambridge.*

Random Review of 1951

Some personal comments by a practising lighting engineer who, looking back over the past year, reviews some of the events of interest and advances made in the field of lighting.

By B. F. W. BESEMER

Lamps

The Monopolies Commission has published its report on the electric lamp industry. We do not desire, and this is not the place, to analyse the report. Nevertheless, the lighting developments of Great Britain lead the world and all concerned with any aspect of lighting whatever are aware of the great part taken by the electric lamp industry in reaching that happy situation. Not only by their own research, but also by their readiness to render their facilities available to others less favourably situated. The electric lamp makers of Great Britain have earned the thanks of the lighting profession and we gladly quote Sir Henry Clay, the erstwhile Warden of Nuffield College, Oxford and Economic Adviser to the Bank of England, who says in "The Times" on the subject of the report: "If the Government's concern is with monopoly proper and restrictive practices which seriously affect the cost of living, they will have to extend their inquiries further. Meanwhile, it looks as if concentration and joint action have benefited the consumer."

The 1000-watt mercury electric discharge lamp has begun to make its presence felt. With a light output comparable with two 1,500-watt tungsten lamps or three 400-watt mercury lamps, there is much to be said for it in appropriate situations. Requiring an energy supply of around 400 volts it calls for three-phase mains and may be said to be in advance of regulations to the extent that none were drafted with 400-volt mains lamps in mind. Fortunately, most

of the premises where it is suitable for use come under the Factories Act and so are not bound by restrictive wiring specifications which cover three-phase supplies but did not foresee this particular application. The Ministry of Labour administers the Factories Act and, not being bound by any written rules, has shown a welcome spirit of enterprise in requirements for this apparatus.

Silica-sprayed lamps are now available in wattages covering the full domestic range. We wonder why the members of the Electric Lamp Manufacturers Association do not adopt a generic name for these lamps in the same way that they use the term "pearl" to describe internally frosted lamps. Silica-sprayed lamps are better than pearl for most domestic purposes but the practice of each manufacturer advertising them by some special name of his own stultifies their popularity and confuses the public.

Not only can there be no cumulative benefit from the advertising, since there is no apparent connection between the different names, but we can testify from experience that unless a purchaser happens to know the title used for such lamps by the maker whose brands are stocked by the shop he patronises, he will need to use considerable determination before being permitted to buy a silica lamp. Even knowing the name, purchase is not assured. Often it is evident that the salesman knows nothing about such lamps and, after consulting price lists, uses the fact that they cost a few pence more as his reason for not stocking them and recommending pearl instead.

Two of the big lamp-makers now boldly advertise a guaranteed life of 5,000 hours for their range of fluorescent lamps. The remainder of the lamp-makers are more conservative and content coyly to imply that

with their 40- and 80-watt sizes a life of 5,000 hours can be expected.

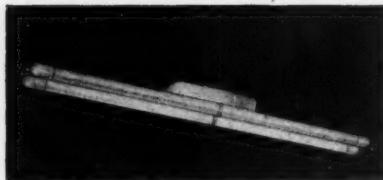
At the International Lighting Conference at Stockholm last summer it was revealed that Great Britain was the only country of the 22 represented which had not yet adopted the principle of reducing bulb dimensions by one step, using, for example, a 60-watt bulb to house a 75-watt filament. It is contended that the change would enable higher wattages to be used in most lighting equipment, but this advantage is more apparent than real. The basic problem in most cases, especially with higher-wattage equipment, is not the size of the

bulb but the light-centre length, which would remain unchanged by the new proposals. Another point often overlooked is heat. A smaller bulb means more heat at the lamp-cap, and already operating temperatures often exceed the safety figures laid down by the lampholder-makers, even although the lamp-makers may be satisfied with conditions for their own product. In fact, the only positive advantage to be gained from the proposal seems to be a slight reduction in the cost of packing.

Fittings

A shortage of "Perspex" during the year caused a number of makers to return, if only for a time, to their old love, glass. This did not always meet with the approval of customers who, on expert advice, had adopted designs from established makers and found themselves a year later unable to match them.

Courtney Pope (Electrical), Ltd., have introduced a circular pendant embodying a circular 80-watt fluorescent lamp and a 150-watt tungsten lamp. Quicklite, Ltd., are selling a range of twin 40-watt, 30-watt and 20-watt fluorescent lamp pendants with the lamps in series, resistive circuits and an overall consumption in all three cases of around 100 watts. A balanced secondary transformer is used and the resistor takes the form of a specially made filament lamp. The twin 20-watt pendant retails at £4 15s.

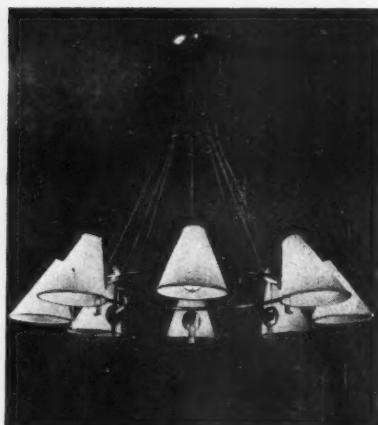


Quicklite twin-lamp pendant fitting.

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In a review of this Jubilee year we cannot omit the jubilee of Linolite. It was in 1901 that young Alfred Beuttell, whilst still a student, patented his invention which resulted in a straight-line filament instead of a coiled one for electric lamps. The invention did not turn young Beuttell into a lamp-maker but it did lead him into making reflectors and general lighting equipment for the lamps which he had patented, and to-day Linolite, Ltd., with Mr. Alfred Beuttell as the governing director, is the principal source of linolite and other small cross-section reflectors and accessories for double-ended tubular and fluorescent lamps.

We welcome Mr. A. D. S. Atkinson's new text book, "Modern Fluorescent Lighting," which was published during the year. It replaces his "Fluorescent Lighting," which was published some six years ago and ren-



Troughton and Young ceiling fitting housing eight lamps.

dered out of date by the march of progress. We are pleased to note that in this authoritative volume the clumsy and sibilating "lumens per square foot" is not to be found. Throughout the author uses the shorter and more vigorous "foot-candle."

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and the twin 40-watt at £5 15s. 8d., complete with lamps in each case. The lightweight fittings are made to plug straight into existing pendant-holders, so that rewiring is not involved. At the time of writing we are not in possession of technical lighting data concerning them, but superficially they do

not seem to be inferior in lumens per watt to other resistive ballasted equipment.

The G.E.C. gymnasium fitting, taking two 200-watt tungsten lamps, is, so far as we are aware, the first unit designed specially for such use and with its wide but louvred light distribution, substantial metal construction and ease of wiring and mounting is well adapted for its purpose.

The "brick" chokes for 40-watt and 80-watt fluorescent lamps are steadily increasing in popularity. Brick chokes are a compromise between the awkwardly shaped chokes which were made so hastily when the fluorescent lamp was introduced early in the war and the streamlined pattern introduced after the war to facilitate the problem of housing the control gear in decorative fittings, but which was not an altogether sound pattern in other ways. It may be remembered that we entered a plea for a redesigned choke in "The Random Review of 1949."

Street Lighting

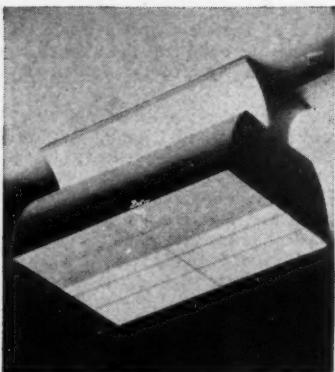
"Lamps for Street Lighting," a recent article in *Light and Lighting* by Penny and Clack, points a powerful argument for group-changing of lamps for public lighting installations. Where replacement labour costs are high and temporarily unlighted lamps cannot be tolerated the case is reinforced.

As we go to press the zebra pedestrian crossings now used in London are the subject of much argument. We shall not venture into the arena except to suggest that their presence would be thrust more surely on an inattentive motorist's mind if the stripes ran diagonally instead of lengthwise along the road. We mention the crossings because of the beautiful white stripes—or white background for the black stripes, if you prefer. Here is a road surface which, our borough engineer friends advise, withstands wear to an acceptable degree and with a reflection factor far in advance of any normal surface. At present it is costly and there is a shortage of the principal pigment, titanium oxide. A white road surface one-eighth inch thick costs about 15s. per square yard laid whereas a normal three-quarter inch wearing course can be laid for around 9s. 6d. per square yard. Doctor Glanville, the director of the Road Research Laboratory at Harmondsworth, a branch of the D.S.I.R., is doing yeoman research work, and if he could be persuaded on the right lines doubtless modified mixtures and methods of application would close this price gap. Doubtless, too, the chemical industry

could rise to the occasion and remedy the shortage of anatase titanium oxide. Dare we express the hope that the wearing course of the urban road of the future may be white?

The recent article by Mr. Collins and Dr. Harper in *Light and Lighting* on "Plastics for Street Lighting Equipment" brings up to date our ideas on this subject. As the new polymethyl- α -chloracrylate possesses higher temperature resistance as well as better mechanical properties than "Perspex," this material would certainly seem to have a rosy future for street lighting if its price is reasonable. We would like to know a little more about the defects of polystyrene, however. In many ways it is ideal and compares favourably in cost with other plastics. If the defects which develop after "prolonged" exposure take long enough to show themselves it may still be worth-while, replaced periodically. We feel that the authors' apology for the very modest tolerance of plus-and-minus one-sixteenth of an inch in the eleven-inch diameter of the five-foot "Perspex" cylinder constitutes a case of praising with faint damns.

In our opinion not nearly enough attention has been given to a modest article which appeared in last April's *Light and Lighting* describing a trial public lighting installation of fluorescent lamps and reflectors fixed to building faces. This installation, together with another in Liverpool similar in principle but using tungsten filament lamps and described at the annual conference of the Association of Public Lighting Engineers last September, involves a method of lighting narrow streets where the buildings flank the footpath which, it is true to say, few if any lighting engineers would have considered if presented with the problem. The principle has not been to put lanterns out on brackets from the building faces, with a balanced light distribution up and down the road, but to use equipment fixed direct to the wall and possessing only a 180 deg. distribution horizontally. Advantages in increased visibility are claimed over conventional installations of the same loading, but other and more tangible gains are lower installation costs, easier cleaning, no obstruction of the footpath and negligible wilful damage. Possibly this last item is because nearby windows act as a deterrent to small boys with catapults. The position of the lanterns also greatly reduces the stray light poured into bedrooms, which is a source of so much annoyance to residents in conventionally-lighted streets of this type. There is one obvious disadvantage,



Specially designed G.E.C. gymnasium fitting.

the need for a wayleave to fix each lantern. If, however, after the trial the principle is proved to possess substantial advantages, then no doubt the matter of wayleaves can be overcome as it has been in Paris. Mr. Smith of Liverpool Corporation and Mr. Ossitt, of the South-eastern Electricity Board are to be congratulated on the originality of their approach to a common problem.

Industrial Lighting

The rolling mills at the Abbey Steelworks, in South Wales, opened earlier this year, are the largest in Europe. Pig-iron arriving at one end of the vast mills passes in a continuous, uninterrupted process to emerge at the far end of the mills as steel-plate at speeds of up to 2,500 feet per minute.

Details of the lighting have been reported in our last issue, but it is pleasing to find lighting intensities of 30 foot-candles in the drawing offices, 20 in the cold-strip mills and no less than 12 foot-candles in the rolling mills and boiler-firing floor, despite the fact that the premises do not come under the Factories Act. The principal lighting is by Holophane "Brabazon" and B.T.H. "High-bay" mixed tungsten and mercury reflector units, both of which have been described in detail in previous issues of *Light and Lighting*. It is interesting to note that mixed units were chosen expressly to avoid a prolonged, complete black-out in the event of a momentary interruption of supply.

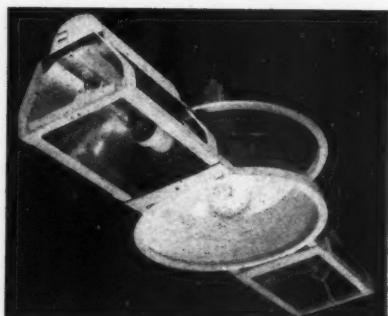
The Council of Industrial Design can be relied upon to produce a provocative spokesman, and its Chief Information Officer, Mr. Paul Reilly, is in the tradition with his

article, "Industrial Design and the Lighting Industry," which appeared in the March issue. He says that "Between the two wars there were valiant attempts to give electric-light fittings more logical forms, but these were acceptable in the main only for kitchens, bathrooms, hospitals or offices. . . . There has seemed in this industry no half-way house between the functional or classical and the lush suburban, the office desk-light and the over-hatted vase." How right he is, with a few honourable exceptions. He recognises that fluorescent lighting presents fresh problems, and pleads for designs that are "neither bald nor titivated engineering."

From the literature and other approaches we receive from time to time from metal-work makers of other industries it is apparent that neither ignorance of lighting principles nor lack of electrical experience has deterred some of these gentlemen from obtaining supplies of the diffusing plates and troughs offered by the plastic and glass trades, wrapping metal carriers round them and calling the products electric light fittings. This, perhaps, is reasonable enough, especially when we remember some of the excursions of the electrical industry in the past when business was bad, but there can be no excuse for the monstrosities sometimes proffered when it is remembered that the Council of Industrial Design makes available to manufacturers both the experience of its industrial officers and the services of the Board of Designers.

Transport Lighting

In its recommendations made in a report published by the Ministry of Transport, a working party on Ships Navigational Aids suggests orange lighting for ships' chart-



B.T.H. blended fitting, incorporating tungsten and mercury vapour lamps.

Trial installation at Eastbourne with fluorescent lamps fixed to the face of buildings.



rooms. The reason is stated to be that orange offers a little more disturbance to dark-adaptation than red but less likelihood of confusion with steaming lights.

Has the working party considered brown? We know of at least one occasion during the war when, in difficult visibility, a flotilla was run aground because the senior officer saw on his beam a red flashing light which he took to be a buoy marking a bend in the channel. In fact the buoy was some half-mile further on and the light he saw was the red-lighted binnacle of an anchored ship as it pitched and rolled in the heavy seas. Buoys use white lights as well as red, and in bad weather it is easy to mistake an orange light for a white one dimmed by mist or spray. So far as our own primitive experiments go, a "bottle-glass brown" filter offers negligible interference with dark-adaptation coupled with the minimum possibility of confusion with navigational lighting. Furthermore, if we are not disclosing secrets, we have reason to suppose that the Navy of at least one sea-minded nation is now using this colour.

The shipbuilding industry of the country continues to supply the world and the lighting industry worthily upholds British workmanship and design in the lighting equipment which the vessels carry to the four corners of the earth. The T.S.S. Ocean Monarch, intended for the Bermuda-New

York run, is one of the latest on the western ocean and the R.M.S. Oronsay an example on the England-Australia route. This latter is especially notable in that it seems to mark a break in the long succession of new luxury liners in which cold cathode lighting predominated. In the Oronsay all the public rooms, foyers, shops and many of the first-class cabins are lighted by Metrovick mellow fluorescent lamps. The extensive use of special units concealed or recessed behind louvres and other screens has made the lighting an integral part of the decoration rather than a separate feature of it.

In *Light and Lighting* Lumeritas refers to Sir John Parsons' difficulty in discerning names of railway stations from the train in which he travelled, and shortly afterwards British Railways were fined a large sum for injuries sustained by a passenger, due to what the judge described as "this passion for anonymity." We believe there was a Board of Trade law which compelled railways to provide a legible nameplate under every platform lamp. The L.N.E. Railway, and doubtless others, too, certainly devised an effective arrangement to conform with it. We wonder whether this is one of those rights with which our legislative grandfathers intelligently endowed us but which was improvidently thrown away when the Nationalisation of Railways Bill was drafted, or does the Board of Trade turn a blind eye

to the shortcomings of the railways now that they have married into the family?

Other Applications

The spate of information on shop and shop-window lighting in last February's *Light and Lighting* included articles by such experts as Mr. Lucking, the Display and Publicity Manager of Liberty and Co., Mr. Tate, of the Lighting Service Bureau, and Mr. Olsen, the managing director of Courtney Pope (Electrical), Ltd. We speak with all sincerity in venturing to congratulate these gentlemen, and, indeed, all who are concerned with shop lighting in this country to-day, for the skill and ingenuity with which they provide us with so plentiful a display of light and yet conform with the restrictions which the shortage of plant imposes.

It was interesting to read of the post-war relighting of Canterbury Cathedral in the May issue, though for the most part the information provided would have been of more value to electricians and wiring contractors than it was to lighting engineers. The Chapter House was one of the principal features relighted, and we are told the type of wiring, switching details and the number, wattage and positions of fittings but nothing about their distribution, dimensions or type except that they have segmented anodised aluminium reflectors with adjustable screens. New bronze floodlights with semi-circular glass panels were designed, we are told, to fit into the flutings of the columns to light the Nave Altar and the Rood Screen, but again there is no mention of distribution and no illustration of the equipment. And not a single lighting intensity quoted in the whole article.

We feel that sometimes there is a reluctance to quote intensities where they are poor in relation to the wattage used, but, even in factory lighting, quantity is very far from being the sole criterion. Infinitely more so is this true of a place like Canterbury Cathedral, which is a part of our national heritage. Every lighting engineer of experience appreciates that many authorities and points of view would need to be resolved before a scheme could be approved. Often the final problem for the designer is to produce a scheme which will be contained within the notions and physical limitations laid down by the various bodies concerned and yet satisfy his own conscience by its quality. We recollect one cathedral where, before our scheme was finally accepted, we were

required to give an undertaking in writing that the equipment proposed was not normally used in stage lighting.

The Illuminating Engineering Society's visit to the new House of Commons was interesting but, like the article on Canterbury Cathedral referred to above, did not seem much concerned with the lighting equipment. However, I.E.S. members had been informed of the installation details by a comprehensive paper at a previous meeting, so it would be churlish to complain. We were certainly honoured with a privileged visit to the Debating Chamber, where the illumination was put through its paces, so that we saw the effect at the receiving end. And very well done it was.

Those of us who considered that some things were a little overdone, smiled rather maliciously to learn that the Speaker resolutely refused to use at all the 20-watt lamp which, controlled by a motor-driven dimmer, had been installed in the canopy of his chair. However, this is a small point. The installation generally is a credit to all concerned.

The return of the House of Commons to its proper place enabled the Lords to return to the Chamber which they had graciously yielded to the Commons when the House of Commons was destroyed. Naturally the place was refurbished before occupation was resumed, and the opportunity was taken to improve the lighting. The substitution of prismatic reflectors in place of the bare lamps which hitherto had lighted their Lordships, together with the addition of some indirect lighting, were all embodied in Pugin's original pendants and constitute the principal lighting of the Chamber to-day, a tribute alike to Pugin's handiwork and the adaptability of modern Holophane equipment.

A letter from Mr. Allphin, of the United States, to *Light and Lighting* tells of a simple scheme for organising a class monitor to switch on schoolroom lighting when the intensity of natural lighting falls to a predetermined value on a photo-electric cell scale, a much more simple plan than the alternative of automatic control. Usually we are able to twit our American friends on their preference for elaborate gadgets rather than simple straightforward devices. Mr. Allphin shows us the way to simplify.

The series of articles on school lighting which have continued in this journal through most of the year are a measure of the importance of this subject. Dr. Hopkinson and others provided the basis, and we must mention also Messrs. Johnson-Marshall and E. F. Samuel, who were responsible for

one of the articles, and linked design and lighting requirements in, to us at any rate, a refreshingly original manner. We note one writer advocates 10 ft.-c. in gymnasiums to be obtained by fluorescent lighting. Even with twin-lamp circuits, the rapidity of movement in the normal gymnasium can result in stroboscopic effects under fluorescent lamps which may lead to an accident.

"Screen Visibility in the Motion-Picture Theatre" and "Projector-Arc Lamps for Motion-Picture Presentation," by the projection engineer of Circuits Managements Association, Ltd., Mr. R. Pulman, deal with interesting aspects of lighting which seldom come within the professional orbit of lighting engineers. Our only criticism is the persistence with which Mr. Pulman calls cinemas "motion-picture theatres." Mr. Sampson's article on "Television Studio Lighting" is equally informative on another matter of specialised development. We were particularly impressed with the difference between cinema studio and television studio lighting requirements.

The South Bank Exhibition, now only a memory, has been described in some detail in these columns. Generally speaking, there was nothing new from the lighting standpoint, but there were some unusual if not original applications of basic phenomena. The English Electric Company's water turbine exhibit in the Dome of Discovery, for example, was a working exhibit with

the rotor revolving much too fast to be seen except as a vague swirl in a mist of water. By alternating mercury electric discharge and tungsten filament lighting the visitor was enabled to study the blading with ease, the rotor appearing almost stationary by the stroboscopic effect of the intermittent light from the electric discharge lamp.

The South Bank Exhibition has done for the internally silvered spotlight lamp what the General Strike did for broadcasting: it has put it on the map. Never before have spotlight reflector lamps been used in such profusion, not in hundreds but in thousands, for every conceivable and nearly every inconceivable lighting purpose.

Excepting special effects such as the flicker for the English Electric water turbine described above, the entire interior lighting of the Dome of Discovery originated from "Linolite" reflectors and spotlight reflector lamps.

The lighting exhibit in the Homes and Gardens Pavilion was well done, with the sequence lasting just the right time. It seemed odd not to have a study lamp in the display; but, then, study lamps seem to be nobody's darling in Great Britain to-day.

The G.E.C. is to be congratulated on the simple submersible floodlight designed for the fountains and, like nearly everything else, using reflector spotlight lamps. It is interesting to note the basic difference between the French and the British approach

The Vroomen Dresmann's store, Rotterdam, the lighting of which has caused considerable comment.



to underwater lighting problems. Almost invariably the British choice is a heavy submersible device, and almost equally invariably the French method is to use the flimsiest of lighting equipment and pop it behind a porthole.

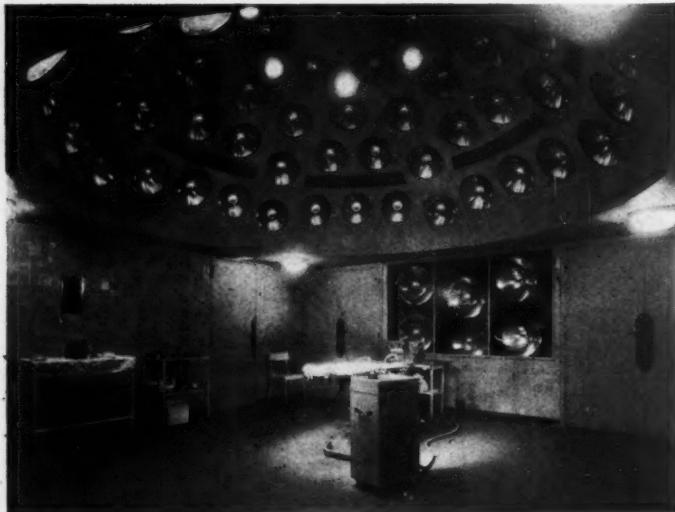
From this general conclusion we must exclude Thorn Electrical Industries, who now employ their "Atlas" fluorescent lamps immersed in water, with waterproof sleeves over the caps. The Steine Fountain at Brighton was lighted in this manner, colour-changing effects being achieved simply by switching and dimming different coloured instant-start lamps.

The lighting of the White Bear Inn, known

capacitive, an inductive and a resistive circuit respectively, completely eliminate stroboscopic effect.

The conference also included the presentation of a paper on Electro-luminescence. The American I.E.S. had a paper on this phenomenon a couple of years ago. From the silence which enshrouds the research laboratories of this country on the subject we suspect that developments impend.

We note that the National Illumination Committee has again provided for five of its seven offices to be held by two gentlemen of whom one is in the gas industry and the other in a company concerned with both gas and electric lighting. Furthermore, these



Mazda lighting in the operating theatre of a French hospital.

to an older generation as the Brasserie Universelle, in Criterion Buildings, Piccadilly Circus, is another addition to the list of installations that should be seen in London. Indirect tungsten and louvred cold-cathode lighting are combined in a clever and easily adaptable manner. Harold Wyatt is the designing architect and Courtney Pope (Electrical), Ltd., the fittings makers, with Plyglass, Ltd., an interested party.

Empire and Foreign Notes

Last year's conference in Paris of the Association Française des Eclairagistes is reported to have included a demonstration that three fluorescent lamps together, on a

same two gentlemen were appointed leader and deputy leader of the British delegation to the conference of the International Commission on Illumination held at Stockholm during the year. Both gentlemen are most able, of unimpeachable integrity and greatly respected by everyone, but this continued lop-sided representation of the lighting industry by gas interests should be reconsidered. Of the 22 countries which are members of the International Commission we are, we believe, the only one to be represented on the executive committee by a gas man.

Following Mr. H. C. Weston's paper on "The Determination of Recommended

Values of Illumination" at the twelfth session of the C.I.E. held at Stockholm, it was agreed at the final plenary session that codes of recommended values should have a common basis and all member countries were recommended to study the basis of visual performance and ease of seeing adopted in the British I.E.S. Code, which, it was thought, was reasonable, though economic or other reasons may impose a different basis on some nations.

One result of Dr. J. N. Aldington's paper on "Light Sources" at the same conference was an arrangement for member countries to accumulate further data on the colour of electric discharge lamps. One of the intentions is to clear the way for national and international specifications on the fluorescent lamp, that elusive pimpernel of the colour world.

One of the recommendations of the International Commission is for a unit of luminance to be called a "nit." We feel that dignity is best served by confining our comments to an expression of gratitude that the proposal refers to a metric unit and not a British one. However, we cannot refrain from adding that "Lux" now acquires a new significance.

We must not close these Empire and Foreign Notes without mentioning a store in Rotterdam which has been relighted with originality by Philips equipment. Briefly, the ceiling is painted dark blue and a foot or so below it are suspended light metal joists forming 4-foot squares. The lighting units are completely self-contained and are arranged to rest in the squares formed by the joists, taking their supply from unobtrusive plug sockets on the blue ceiling. By this means any concentration and pattern of lighting can be used, readily adaptable according to the display arranged below.

Colour and Decoration

Under the happy title "Lighting the Way," Mr. A. B. Read, one of the few holding the coveted title of Royal Designer for Industry, has written castigating contemporary design in the electric light fittings industry. In other industries the experimental design studio is an accepted unit of most firms. The result is a reasonable standard of purposeful design which is seldom to be found in electric light fittings. The author pleads for small research units experimenting with design needs and trends, new and little-used materials and the like, a visual form and research unit additional to and collaborating with the scientific side

which looks after technical requirements and current media of illumination. It seems generally to be agreed that there is too much science and not enough art about decorative lighting equipment to-day, and Mr. Read shows the way to restore the balance.

Ophthalmological Matters

The conference on "Subjective Judgments," held a year or so ago, was organised by a private group, with Dr. Hopkinson as secretary. Its purpose, to systematise the techniques of objective studies which involve Man as a measure of his surroundings, brought together many psychologists, engineers, physicists and others and cleared away a considerable accumulation of deadwood which has hindered in the past a proper appraisal of comparative data.

Dr. Ishek, of Cairo University, who has been working in Dr. Wright's laboratory at Imperial College, gave an interesting address to the Colour Group on "The Colour Vision Characteristics of Egyptian Trichromats." Dr. Ishek has established that though the "standard observer" of the International Illumination Commission may be a standard western observer he is not a standard eastern one, since Egyptian subjects possess lower luminosities in the blue. This could be attributable to an increased density of the yellow pigment covering the central area of the retina, though our personal view, for what it is worth, inclines to consider it more likely that the pigmentation will be found in the crystalline lens. Bearing in mind the Blue Nile, the Yellow Sahara and the present Egyptian troubles, we feel that a moral of some kind could be drawn from all this.

The diagrams on ward lighting in the article by Mr. J. K. Frisby on "Fluorescent Lighting in Hospitals" is a reminder of the revolution in lighting that these lamps have caused. Mr. Frisby's observations on Operating Theatre lighting are not so comprehensive, and we would like to know the medical view in this country of "la Voûte Blin," the French scheme whereby the operating table is at the focal point of a dome perforated by some 60 apertures with projectors behind them. Only a small area, involving half a dozen or so lamps, is alight at a time, under the direct control of the operating surgeon, and providing something like 800 foot-candles at the operating area. It is claimed that the high intensity, coupled with the directional nature of the light, provides seeing facilities not obtainable by any other system. We saw an operation carried



Unusual lighting treatment by Courtney Pope (Electrical), Ltd., at White Bear Inn, Piccadilly.

out by its light, and the surgeon spoke enthusiastically of it. The installation was a prototype, but we understand that several others are being constructed.

Miscellaneous

The article by Mr. R. R. Holmes on "Brightness Terms," which appeared in this journal last July, was wholly admirable. He advocates the term "foot-candles" because candles are familiar objects, and most of us have at some time or another seen the illumination produced by such a source at a distance of about a foot. Consequently, though inexact, a very positive visual idea is based on the term. On the other hand, no one has seen a lumen, so that "lumens per square foot" calls no image to mind at all. This point alone would ensure mention of the article in this review. What possible reason could the National Illumination Committee have had in mind to try to substitute this polysyllabic highfalutin

cacophony for the simple, euphonious and adequate "foot-candle"?

Three happy trends are noticeable in *Light and Lighting* over the course of the year, namely: the increasing use of the "Situations Vacant" column by members of the industry, the publishing of intensities in technical descriptions, and the gathering interest in the reinstated Correspondence Columns.

The October article on "Load Shedding and Light Sources," by D. F. Chapman, is a timely reminder that within certain limits fluorescent lamps are affected considerably less than tungsten filament lamps by voltage fluctuations. Fluorescent lamps may give more lumens per watt when the supply voltage is low, by reason of the reduced lamp current, causing reduced lamp temperature, causing reduced mercury vapour pressure, and so an increased ultra-violet radiation at the critical 2537 Å wavelength. This prompts us to ask why a lamp is not

designed to provide this higher efficiency under normal instead of abnormal conditions? The author does not mention the effect of ambient temperature on the starting qualities of fluorescent lamps. A lamp which starts readily in a comfortably heated room may easily take 20 volts more to strike in unheated premises.

Mr. Robinson's paper presented to the I.E.S. early in the year on "Brightness Engineering" certainly put the cat among the pigeons, which is what Mr. Robinson intended. Disputes on the subject from doughty protagonists have enlivened the correspondence columns of this journal ever since.

We are reminded of some thirty years ago, when the Lighting Service Bureau was approached from the other side of the I.E.E. premises, served by the slowest lift in London, and a prominent Borough Electrical Engineer had the temerity to suggest, at a meeting there, that to measure working intensities in foot-candles, or any other unit, was quite unnecessary. An indignant Bill Bush, the Bureau Manager of those days, hotly asked the prominent B.E.E. how he knew when the boilers at his generating station had raised sufficient steam. Did he put his hands on them to feel if they were hot enough!

One of the facts which we were astonished to learn about the South Bank Exhibition was that the Skylon was built by British Insulated Callenders Construction Co., Ltd. We were equally astonished thirty years ago to find that the General Electric Company made beer bottle stoppers and pickle jar tops.

The paper which Mr. H. F. Stephenson presented to the I.E.S. on "The Equipment and Functions of an Illumination Laboratory" was noteworthy for the skill with which the author presented in a popular form a paper which it would have been so very much easier to have delivered for the laboratory expert only. In the ensuing discussion he was taken to task by one or two speakers for not having done that very thing but the evident impatience of the audience with some of these gentlemen constituted a tribute to the wisdom of the author in his selection of material for the paper.

The first Trotter-Paterson Memorial Lecture was meaty, as we have learned to expect from the redoubtable Dr. Walsh who delivered it. We were astonished to learn that Count Rumford was an Englishman and Sir William Preece, when Chief Engineer of the Post Office, the originator of the idea

of measuring the illumination received from a source instead of that which the source disseminates.

Although the lecture commemorates two who are no longer with us, a pleasant fact which it brought to mind was that so many of the elder statesmen who support our proceedings are from that band of early pioneers, Professor MacGregor-Morris, Lord Edgecumbe, Parsons, Dudding and others.

Mr. Waldram's article on "Lighting Aims and Techniques" does not disappoint. The Glarologists and Comforficians receive their meed of praise, whilst Decorators, Modelers, Colorists and the lucky people who return brown and vigorous from "the best holiday they ever had" after spending a fortnight in conditions of glare and lighting which defied every code, also receive honourable mention.

John Dow, that grand old man whose guiding hand steered the I.E.S. so wisely for so many years, emphasised in his Presidential Address not long before he died that our association is the Illuminating Engineering Society and not a society of illuminating engineers and that art must be combined with engineering if good lighting is to result. Mr. Waldram lays down the same principle when he says in his concluding paragraph, "Perhaps the most important lesson to be learned is that a controlled variety is far more pleasing than uniformity."

We will close on that thought, which has significance far beyond the lighting profession.

Erratum

We apologise for the error on p. 426 of the last issue on which the blocks of two lighting fittings by Troughton and Young were inverted.

Personal

MR. M. GAUGHAN, B.Eng., A.M.I.E.E., F.I.E.S., has recently been appointed to the Government and Railways Department of the B.T.H. Lamp and Lighting Department at Mazda House, Fitzroy-road, N.W.1.

Philips Electrical, Ltd., announce that MR. N. D. HOUSTON, formerly Branch Manager at Cardiff, has been appointed Regional Manager of their Glasgow Branch. MR. J. JORDAN has been appointed Cardiff Branch Manager in succession to Mr. Houston.

Ekco-Ensign Electric, Ltd., announce that, on January 1, they are opening their new London headquarters in Essex-street, Strand.



Colston Hall, Bristol

The new Colston Hall recently opened replaces the one which was burnt down in 1945, and is one of the three major concert halls which have been erected in this country since the war. This hall is intended to serve not only for concerts but also for boxing and dances. The architect responsible for the design of the new hall was J. Nelson Meredith, F.R.I.B.A., City Architect, Bristol, with T. S. Singer, A.R.I.B.A., as the senior assistant architect in charge of the project. The consulting engineers were Messrs. Hoare, Lea and Partners. Troughton and Young (Lighting), Ltd. were asked by the architects to discuss the lighting at an early stage, and a full scheme was prepared. The detailed designs of the special lighting fittings in the auditorium were prepared by A. B. Read, R.D.I., Director of Design, Troughton and Young (Lighting).

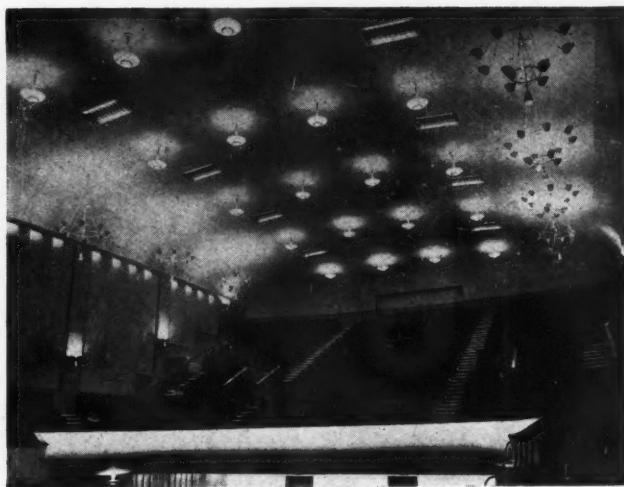
The scheme, as installed, comprises the main lighting of the auditorium by means of lamps behind the ten air-intake grilles in the main ceiling. This was supplemented by

special decorative pendants, ceiling and bracket fittings. In addition, rows of cold cathode tubing were used indirectly in cornices to relieve the lighting effect on the ceiling and walls in various parts of the hall, and 2-ft. fluorescent lamps were installed horizontally at the top of the walls.

The lighting of the platform area was given special consideration in view of the higher intensity required, and a number of 1,000 watt reflectors were recessed into the canopy with two 1,000 watt lamps spot-lighting the conductor.

The auditorium ceiling fittings comprised a large "Perspex" bowl with a louvred base on a stem, spaced in five rows of four fittings between the air-intake grilles. These fittings gave both illumination on the ceiling as well as a general light downwards over the centre area of the auditorium. Eight multi-light pendant fittings were spaced four on each side of the hall, again between the air-intake grilles, and these comprised a top tier of eight, and a bottom tier of four indirect

Arrangement of ceiling lighting fittings in the auditorium.



reflectors, each housing one 100 watt lamp, with a central direct reflector with a 150 watt lamp. On the auditorium walls special three-light brackets were designed to harmonise with the eight main pendants, using one direct and two indirect reflectors. The reflectors on both the pendants and wall brackets were finished copper anodised aluminium. Certain lamps in the auditorium fittings were connected to an emergency supply. The switching of the various groups

of fittings was so arranged that various intensities of illumination could be obtained for the different uses to which the hall will be put. Various additional fittings were provided in other parts of the auditorium as well as for the entrance hall, foyers, etc. The overall intensity of illumination in the auditorium exceeded $10 \text{ lm}/\text{ft}^2$.

Acknowledgment is made to the "Electrical Review" for permission to reproduce the illustrations on this page.

Showing view of the platform area from the balcony.



Modern Lighting in a New House

The house illustrated on this and following pages shows how it is possible to get away from the traditional and unimaginative methods of home lighting and to achieve excellent results by considering the lighting arrangements in the original design of the house. The architect was G. Grenfell Baines.



The above picture shows the cheerful appearance of the exterior of the house at night with all the lighting in use. It also gives some idea of the fenestration which was designed to give a high daylight factor in every room, all rooms except the small bedroom having two windows.

The artificial lighting is entirely by means of fluorescent lamps with the addition of two tungsten spot-lights in the dining-room. Altogether thirty-seven lamps are used ranging in size from 20-watt to 125-watt. The total installed lighting load is 1,600-watt.

The left-hand walls of both the hall and the lounge (see bottom picture facing), are taken up by large windows beneath which are concealed fluorescent lamps directing light down on to the curtains and upward to the ceiling via a deep cornice moulding specially shaped to give an even brightness. Another interesting feature of the pelmets is that the boards are inclined slightly inwards at the top so that they receive a certain amount of reflected light from the cornice, reducing the brightness contrast between the cornice itself and the pelmet board. Note the fluorescent trough lighting on the right



lighting the inner part of the hall, the entrance from the porch (not shown), and the stairs.

The lighting of the lounge, three views of which appear on this page, is most interesting. Additional pelmet lighting is provided over the other window in this room and there are two troughs sunk in the ceiling, each containing two 40-watt fluorescent lamps. These troughs are not set in the centre of the ceiling but are rather nearer the wall opposite the fireplace so that as a rule the lights are above and slightly behind

people sitting round the fire. A further source of lighting is provided by a 40-watt fluorescent lamp in the cavity wall at the top of a double glazed false window between the lounge and the hall. This is seen in the bottom picture on this page.

It is possible, therefore, to use a number of different lighting arrangements according to the use to which the room is put, and very pleasant results are obtained. There is a complete absence of



glare and of obstruction from fittings. Though with all lights in use an average illumination of $35 \text{ lm}/\text{ft}^2$ is obtained the result is still extremely agreeable. By using only certain of the lighting features it is possible to obtain very pleasant contrasts of light and shade in the room and on the faces of people in the room.

The dining-room has a cornice fitted with one 5-ft. 80-watt and one 8-ft. 125-watt fluorescent lamps along one wall and two 100-watt louvred spot-lights recessed in the ceiling above the table. The systems may be used independently or together. The upper photograph shows the spot-lights only in use; note the sparkle imparted to the glass and silver. Though the table is polished there is complete absence of reflected glare in the eyes of people seated at the table. The illumination on the table from the spot-lights is $60 \text{ lm}/\text{ft}^2$. The lower picture shows the room with only the cornice lighting in use. The room appears to be



much brighter though the illumination on the table is much lower. The contrasts in the top picture appear to be much greater than they really are. The lighting of the downstairs cloakroom (top left, on next page), is of particular interest as the same lamps are used to light both the outer part of the cloakroom and the inner w.c. The wall between the two spaces has been built to leave a gap on each side of the mirror and into each gap has been fitted a 2-ft. 20-watt fluorescent lamp so that both sides of the wall receive light at the same time. The use of these lamps on each side of the mirror also ensure excellent glare-free lighting of the face. The bathroom mirror is similarly lighted.

The top right picture on the next page is of



the smallest of the three bedrooms all of which are lighted by fluorescent lamps. This particular room which is 14-ft. x 9-ft. wide uses a fitting containing two 30-watt lamps. Note the extended window sill which runs almost the whole length of the room and which can be used as a desk with excellent natural lighting by day, and good lighting from the fitting above, by night.

The lower photograph shows how fluorescent lighting penetrates well into the recesses of the kitchen cupboard eliminating dark shadows and making the contents clearly visible. Two fittings each of two 30-watt lamps are used, one over the built-in units along one wall and a similar fitting, at right angles to the other, over the sink unit.



Church Lighting — Two Recent Installations

In the following article, the authors advocate the use of tungsten rather than fluorescent lighting for churches on the grounds that it is more suitable and more economical.

The recent lighting installations in the parish churches at Bletchingley and Mickleham, in Surrey, are of particular interest in these days of fluorescent lighting, as they typify the beauty and simplicity which can still be obtained with the tungsten lamp. Few churches need their light for more than a few hours each week, and costs of current consumption and lamp renewals are therefore of little consequence. The advantages, therefore, which make fluorescent lamps so valuable for factories and offices no longer apply, and the high initial cost of these lamps and their control gear make tungsten lamps, at a few shillings each, a much more attractive proposition quite apart from the more suitable quality of tungsten lighting for churches.

In so many churches, and particularly in medieval churches, the necessity of designing fittings immediately presents the problem of producing something in keeping with the character of the building. The tungsten lamp, however, used with a scientifically designed reflector can, in many cases, be so concealed within the framework of the building that fittings can be dispensed with and the full beauty of the building seen without interruption.

Although the principles

governing these two installations are the same, there are considerable differences both in the methods of application and



Fig. 1. Mickleham Church, showing Chancel and Altar.



*Fig. 2 (above).
Bletchingley
Church. San-
ctuary looking to
the side chapel
memorial.*

in the lamps used for the different parts in each church.

In order to overcome the difficulty of concealing reflectors for lighting the altars, in both cases 12-volt lamps have been used in reflectors measuring no more than 5 in. in diameter. At Mickleham a bank of three 48-watt reflectors is fitted behind a beam a few feet in front of the altar table (Fig. 1), whilst at Bletchingley, similar banks of reflectors are concealed behind the piers supporting the side arches. One bank of fittings can be seen in Fig. 2, which also illustrates the suitability of low-voltage lamps for the lighting of side altars, memorials, etc.

The lighting of the chancel can usually be effected satisfactorily from behind the chancel arch. At Bletchingley a single 300-watt lamp in a suitably designed reflector confines the light to the choir stalls and up to the altar rail, and is so screened as to eliminate all glare from outside this area. Smaller reflectors of similar design are used at Mickleham from the roof beams. It is important when designing altar and chancel lighting to light the front of the altar but to avoid



*Fig. 3. Another
view of the
interior of
Mickleham
Church.*

glare from the altar steps. This has been successfully achieved in both these installations.

In the lighting of the two naves there is an essential difference based on the construction of the buildings. Normally congregations face the chancel, and where the framework of the building precludes complete concealment of the fittings, the principle of throwing the light slightly forward from behind roof beams or similar constructional features enables the fittings to do their work but yet to be screened from normal view. This is, of course, an accepted principle which has been used in many churches, but at Mickleham the reflector has been constructed with a system of concentric louvres designed to screen the view of the lamp and to limit the glare of the fitting to the light beam itself. The effect of these fittings looking east and west can be seen in Figs. 3 and 4.

Fig. 4 (right). Looking West in Mickleham Church.

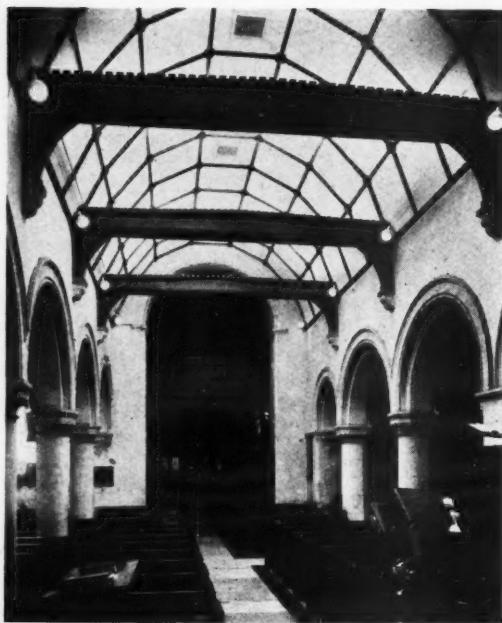


Fig. 5 (left). View of main aisle, Betchingley Church.



Eight 150-watt fittings at 20 ft. from the floor give an average of 5 lm./ft.² Additional lighting for the curved ceiling is provided on top of the cross-beams, but this is seldom used.

At Betchingley, the construction of the roof is ideal for the concealment of reflectors for vertical lighting. In this case eight 200-watt lamps are used in suitably screened reflectors fixed at about 30 ft. from the floor between the rafters. The reflectors are coloured a very pale amber, and some idea of the magnificent effect of this installation can be seen (Fig. 5).

It is not as a rule sufficient to rely on a general purpose fitting for church lighting, and the success of these two installations can, in the main, be attributed to the fact that the method of constructing the reflector enables each to be specially made for its required purpose at a reasonable cost.

Lessons in Light and Shade at the South Bank

Before memories of the South Bank Exhibition recede too far into the past, we might all consider what we have gained from this unique experience. In this article the author expresses some personal views on the lighting.

"The Electric Lighting Industry . . . has long been in need of new thought and inspiration. The architects and interior designers of the various pavilions brought a fund of fresh imagination to these details which could not be matched from the Council of Industrial Design's Stock List of current production. There is a good chance that the South Bank will stimulate new ideas and experiments in this important industry."

This quotation is from an editorial of *Design*,[†] the journal issued by the Council of Industrial Design.

"Within sight from Big Ben is the South Bank Exhibition, the lighting of which has been effected in diverse ways—including some which are 'funny peculiar.' . . . The exterior lighting on the Exhibition site is scarcely likely to excite the admiration of those who rate quality higher than quantity. If you like lighting of the garish itinerant merry-go-round variety the South Bank will not disappoint you."

This, readers will no doubt recall, is what "Lumeritas" had to say about the South Bank lighting.[‡] True, it is a personal opinion, whereas the first quotation represents, presumably, the official view of the Council of Industrial Design, but it does suggest that the artist and engineer differ in their opinions of the South Bank lighting.

Now trains from Charing Cross rumble

By RICHARD STEVENS,*
B.Sc., M.S.I.A.

past the empty shell, allowing the traveller only a far-off view of what was once so familiar; but while our memories are still fresh it is perhaps a good time to look back to see if there were any lessons of value to those whose business is lighting.

The purpose of exhibition lighting is largely to create an appropriate atmosphere, and from this point of view the lighting was very successful. In some of the details it was certainly poor, and there were faults that would have been avoided if more regard had been given to the accepted canons of good lighting practice. An example recalled by the writer was in the Outer Space section of the Dome of Discovery. One exhibit showed the form of the stellar systems, and consisted of a darkened enclosure, at the back of which appeared the stars in an apparently infinite space. Between the visitors and the display was a luminous information panel. If the latter were shielded one could discern the sequence of the displays without much trouble, otherwise it was impossible to see a thing owing to the disability glare arising from the dimly illuminated panel.

There were also cases where the lighting, whilst conflicting with accepted ideas, was, nevertheless, very effective. How many lighting engineers, I wonder, faced with the problem of lighting a large exhibition hall some 300 feet in diameter, with a huge domed roof 90 feet high, would decide that no lighting was necessary and rely entirely on spill light from the exhibits? Yet in the Dome of Discovery this treatment and the careful positioning of a few key exhibits was highly successful in creating a feeling of detachment and a sense of space and mystery.

* Illuminating Engineering Department, Siemens Electric Lamps and Supplies, Ltd.

[†] *Design*, No. 34, October, 1951.

[‡] *Light and Lighting*, Volume XLIV, page 228, June, 1951.

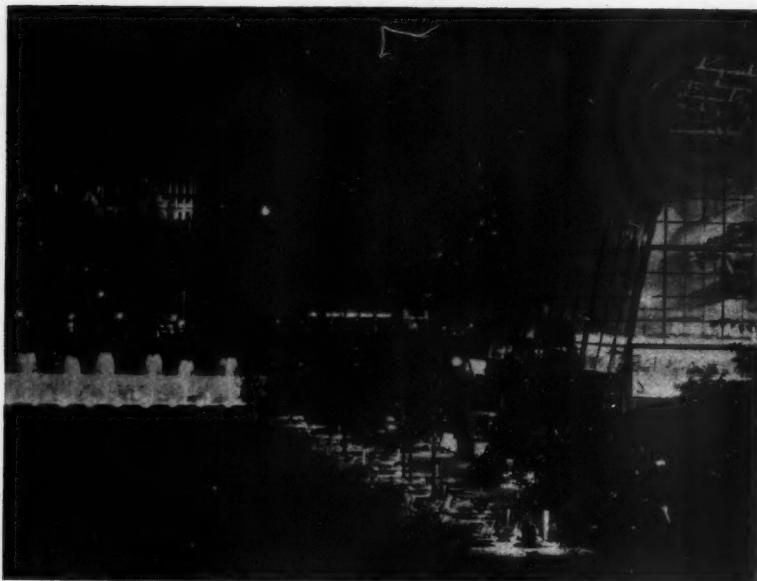


Fig. 1. Light and Shade on the Fairway.

entirely appropriate to a popular presentation of scientific achievements.

The Exterior Lighting

Quite frankly I must disagree with "Lumeritas" about the external lighting. Whatever criticisms are made, it cannot be said that there was an excess nor that the lighting was gaudy, except where it was deliberately so, such as by the seaside section, for which a fairground atmosphere was very suitable. In other parts of the exhibition the outside lighting was deliberately reduced so that the interiors of glass-fronted buildings became effective parts of the general pattern of light and shade. Nowhere was the effect more striking than on the Fairway (Fig. 1). Such details as the wall of water jets, the lights in the trees, the illuminated groups of flower tubs, the shining blue and silver Schneider Trophy plane in the Transport Pavilion and the recessed lights in the Fairway formed a gay and enchanting scene which delighted all who saw it. In particular the Fairway lights were an imaginative touch, the effect of which surely was beyond the expectations of the conceiver. Somehow

one had the feeling that when crossing the Fairway one was walking in space. It may be considered mundane to ask why this was so, but I suggest that perhaps this was a case where disability glare had a desirable effect, and that, as one passed over the lights, the ground itself tended to disappear behind a carpet of stars.

In the success of the outside lighting there was, I think, a lesson of importance to all lighting engineers, confirming, as it did, some good advice given to us some time ago. In the discussion of a paper by Mr. R. O. Ackerley on "Floodlighting,"* Mr. G. Grenfell Baines asked how long it would be before engineers realised that an effect of architecture depended just as much on shadow as on lighting, while in the paper itself Mr. Ackerley pointed out that very often an air of mystery was more appealing than the revelation of every detail. The lighting at the South Bank showed how right they were. As a water-colourist creates his picture, leaving areas of the background untouched yet with meaning through the application of colour elsewhere, so was the

* Trans. Illum. Eng. Soc. (London), Volume XV (No. 10, 1950).

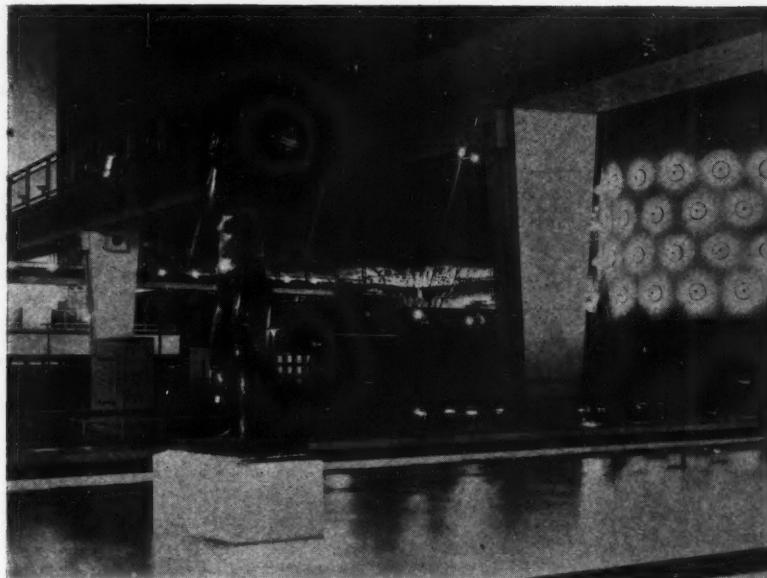


Fig. 2. Contrasts in lighting at the South Bank.

lighting applied to the outside features of the South Bank.

In some places it was obvious that little light was required, such as that quiet corner beyond Waterloo Bridge where there were such wonderful views of the floodlit buildings and ships downstream. But as a secondary result how intriguing in the half-light was the wrought iron sculpture by Reg Butler—whatever one thought of it in daylight. In other places the lighting was restrained with delightful results where, I am sure, many of us would have aimed at high intensities. Sculpture in particular responded well to this approach. Typical was the statue by Karen Jonzen, shown in Fig. 2, which was at the end of a luminous green pool. The subdued lighting and subtle highlights revealed the modelling and beauty of the sculpture in a sensitive manner, giving it an added quality it somehow lacked by day.

In actual lighting equipment there were few details new to lighting engineers, though the elegance of some of the units has not often been matched at an A.P.L.E. exhibition (Fig. 3), and the assured way with which graceful brackets were fashioned out of ordinary piping reminded one that no stigma can be attached to our basic materials but



Fig. 3. A lighting unit outside the '51 Bar.

only to our subsequent misuse of them (Fig. 4). Some details, however, were worth recording for the ideas behind them. One was the new approach to floodlighting involved in the use of a number of fixtures applied to the surface of the structure; examples were the front of the Royal Festival Hall, the base of the Shot Tower (Fig. 1) and the canvas screen along the York-road boundary. Another was the lighting of the overhead walkway from the Waterloo Gate by low-mounted units

sphere, thus the dramatic lighting in the Land of Britain and the Minerals of the Island sections contrasted with the efficient industrial atmosphere of the Power and Production section or the clean, bright interior of the Health section. In other pavilions the lighting merely aimed at a theatrical effect, attention being focused on the well-lighted exhibits by the reduction of surround brightness. In general the lighting equipment used, such as louvred ceilings, spot-light fittings, and flush ceiling units was



Fig. 4. An elegant bracket outside the Sports Section.



Fig. 5. Glare sources in a dark ceiling found in the otherwise very well lighted Thameside Restaurant.

(Fig. 2), an arrangement perhaps worth remembering by street lighting engineers. Yet another idea was the illuminated spinners along the Bailey Bridge. Can we introduce mobile elements into some of our decorative fittings?

The Interior Lighting

Coming now to the interior lighting, it must be remembered that we are looking back not at the lighting fittings exhibited but at the lighting provided by the interior designers and the architects of the various buildings. The effect desired in most cases was the creation of an appropriate atmo-

familiar to lighting engineers and contained few fresh ideas.

A problem for lighting engineers noticed several times throughout the Exhibition and particularly evident in the Homes and Gardens section was one interior designers generally chose to ignore. It has some importance because it arises from a feature common to all forms of present-day interior decoration, whether it is the honest contemporary kind of the South Bank or the escapist period sort commonly illustrated in periodicals devoted to such matters. I have in mind the widespread treatment of walls and ceilings in rich, often dark colours.

Many present-day lighting fittings could not be used in such interiors without causing irritation through discomfort glare, and there were several examples of this at the South Bank (Fig. 5). To say that dark walls should not be used is to ignore the problem; one must agree with interior decorators that, like a low illumination intensity, a dark wall can often be very pleasant. Fortunately a pale wall or ceiling is often contrasted with the darker surfaces, and the principal lighting points could be so placed that they are generally seen against a light background, but advantage was not always taken of this at the Exhibition. Alternatively the application of the graded brightness principle in some cases might have provided more comfortable seeing conditions. One thing is certain, several fittings were incompatible with their environment for this reason.

As was to be expected the hand of the interior designer was more in evidence in places not devoted to display, such as the restaurants and cafés, and it was probably the lighting in these places particularly that

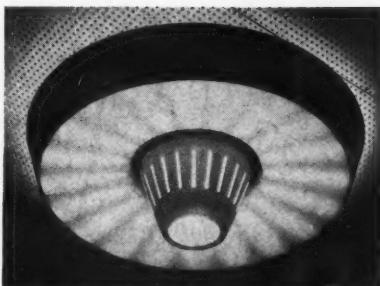


Fig. 7. Type of fitting used in the promenades in the Royal Festival Hall.

"Design" had in mind. There certainly were new ideas there, but hardly a wealth of them. The lessons for us (not confined to the lighting equipment) were not so much of new ideas but of the method of approach to design and the intelligent use of materials now available so that the right one was always selected for a particular purpose and the utmost advantage taken of its special properties. It was also apparent that a true contemporary style cannot be copied, it can only arise when the designer is alive to contemporary feeling and uses in the best possible ways the resources at his disposal. That is as true now as it was in the eighteenth century or in the days of Pericles.

Ideas which appealed to the writer again involved the deliberate use of shadow such as the decorative feature at the entrance to the Thames-side Restaurant (Fig. 6). In particular the fittings in the Promenades of the Royal Festival Hall were very attractive and suggested exciting possibilities (Fig. 7). The patterns of light and shade on the vaulted roof of the Turntable Cafe were similar, and the fittings reminded one that they need not always have an axis of symmetry.

Conclusion

As in all differences of opinions there is an amount of truth in both pronouncements quoted. The Exhibition gave us a lot to think about, but architects and interior designers should also realise that light is their most potent medium, and it should be treated with respect. If other materials are used wrongly the worst that can happen is a feeling of dislike or resentment on the part of the beholder. If light is used badly actual physical discomfort can arise.



Fig. 6. A delightful pattern of light and shade in another corner of the Thameside Restaurant.

Carte Blanche

The following article exposes the dangers which Editors face when they innocently and, so they think, obligingly give contributors a perfectly free hand. Fortunately this result is only an exception and the author wisely wishes to remain anonymous.

Nothing could have a more disastrous effect on the brain than being given *carte blanche* in the choice of subjects for an article. It is extremely flattering, of course, but to be avoided like the plague.

The request comes innocuously enough. It is all so delightfully vague. The date? Well, a month? Two months ahead? Let's say in time for our January issue. And pictures? Well . . . we would like to fill a couple of pages. It depends entirely on the number of words. . . . And so the damage is done.

One month goes by and not an idea has raised its head. Two months go by and an odd note or two has, perhaps, been jotted down and lost, and all the time a sense of guilt is growing.

This makes itself felt at all sorts of irrelevant moments. In one's bath, for instance, in the middle of a film, waiting for a bus. To begin with it doesn't matter much, but then one day the telephone rings and you pick it up quite blithely and a voice says, "It's all right about the article, isn't it?" and because this always happens when the thing has gone completely out of your head, you say, "Oh yes, of course, now when did we say?" And then you suddenly remember and because you feel very guilty indeed, you quickly add, "Just tell me again to make sure."

And the voice tells you what you know only too well already and then the real trouble starts. You really have got it on your mind now, but what on earth are you going to write about?

You think and you think and you think. You turn up all the old unpublished

articles you've ever written, or half written and wonder if any of them would do. You wonder, but you know jolly well way down inside that they wouldn't. You even turn up some of the published ones and wonder if a certain amount of rehashing of one of those would get you by, but it wouldn't. And so you think again.

Now if the paper you're going to write for is of general interest it's not too bad. You have a friend who runs an hotel for dogs, you could write about that. You know someone else who runs a fish and chip shop and you could write about that. You're having trouble with your drains and you could write about that or there's that young man you know whose sister does a snake-charming act on the halls with a couple of pythons her mother got from Bostock and Wombell's, but as the paper you're writing for is highly specialised in a sphere where dogs, fish and chip shops, drains and pythons have no possible bearing, that doesn't help you in the least.

So you tell yourself to think methodically and carefully.

The paper deals with lighting. All right, you're supposed to know something about lighting, that, of course, is the only reason you've been asked to write the article, so it should be easy.

But is it?

Perhaps if you'd never written an article for this paper before it might be different. But you have. You've already said precisely the same thing in slightly different words times without number, so what can you hit on that might be new?

Their January issue, now what does that suggest? New Year resolutions. But who on earth is interested in your New Year resolutions and if you're going to write about resolutions that other people might make, who in the wide world are you to lay down the law?

All right, New Year resolutions are out.

What then? The Festival? Festival Reprise? Festival Review? A year without the Festival? And yet, let's face it, what do you really know about the Festival?

Certainly you tramped around and around the South Bank Exhibition night after night trying to make a photographic record of the lighting points. So what? You look through the photographs and, so sapped is your morale by now, decide that you must have been mad, for anything with less point it would be hard to imagine.

You try hard to recapture the first flush of enthusiasm you felt when you originally saw it all on one of the Press days before it opened, but you can't. Instead you remember the time the camera fell over the edge of one of the galleries in the Dome of Discovery. You remember your several trials in the various pavilions or how nice everybody was the morning you went in early to photograph the Homes and Gardens Pavilion and then wonder if anyone ever sorted out the labels you moved and couldn't remember where they belonged when you came to put them back. You remember climbing about the Festival Hall scaffolding way back in the early days and how pleasant it was to have dinner in the first-floor restaurant and watch the sunset across the river, but none of it makes a lighting article. And yet you've been lecturing about the lighting of the Festival. Surely there must be something you can write on it?

So you really start to concentrate on thinking about the lighting and, at last, start to write. After a few lines you find you have written "functional" nine times and "functionalism" twice so you give that up.

All right, what about the Live Architecture Exhibition in Poplar?

You think hard and remember the church but can you remember how it was lit? Not you. You can remember the two foreigners who attached themselves to your specially-laid-on guide and you can remember how exceedingly cold you got on the boat on the way there and the very odd smell emanating from one of the warehouses you passed, but for the rest, your mind's a blank.

Then you remember the school, but which of the schools was it? The Elementary Secondary, Primary Elementary, Secondary Primary. . . . Whichever it was the colours were charming and you were terribly impressed by the entrance, but best of all you can remember the little girl taking a mug of tea to the headmaster's study and leaving a long trail of drips all down the beautiful

corridor, and that, of course, doesn't make a lighting article either.

Then Battersea, surely there was something about Battersea? But what you remember best there was the man and woman performing on an impossibly high trapeze in a fine drizzle of rain and, on a sunny morning, Maurice Lambert's Pegasus and Bellepheron in the sculpture exhibition.

By now you have written quite a lot, but it is all quite useless. You know it's useless while you're writing it but you hope against hope that by some providential magic it will turn into sense when you read it through. You read it through and it doesn't and you're back where you started.

All right, what else have you been doing? You went to a funeral . . . No. You saw "South Pacific" . . . No. You were amazingly impressed by "An American in Paris" . . . No, it won't help and time's running out.

Already it's Friday and the article has to be in on Monday. Surely there must be something you can write about?

Why on earth didn't you say right at the start that you couldn't do it. It would have been all right then but you can't let them down now.

Not only is it Friday but now it's Friday afternoon. You haven't had any lunch. You daren't have any lunch because you know that if you do you'll be half-asleep afterwards and whatever slight chance there might possibly be of getting anything written would then have gone beyond recall.

You then begin to think about the editor and start to hate him. But that doesn't do you any good, after all, poor bloke, he has to fill the entire paper somehow every month and you've only got to write one article for a single issue. Now what would he want you to write? That leads nowhere for again you know perfectly well that provided it isn't actually libellous or obscene he couldn't care less.

So you ask someone to suggest something and they suggest the Scottish Hydro-Electric scheme and the way it will bring light to people who have never had it before and you think about that. But you don't know a thing about the Scottish Hydro-Electric scheme and without getting a lot of data you couldn't possibly write about it. Nevertheless you ring up the B.E.A. and they tell you that all the dope on that has to come from Scotland and so as there isn't time for that you curse although really you're very relieved.

Then someone else suggests the House

of Commons but you know that's old news and has been covered already and apart from remembering that you got rather a kick in a juvenile way out of sitting in the Speaker's chair, and thinking it was rather odd that anyone should want to make glass look like wood, that, too, fails to strike a responsive chord.

And once upon a time you thought you could write! You once actually told someone that you were connected with journalism.

Drearly, wearily, at your last gasp, you telephone the editor. It's an awful admission but you just must admit it, you can't think of anything at all and if he's got to have the stuff by Monday.... You're really most terribly sorry, and, you know, you are.

Equally wearily he listens to you. "Well, I could give you until Thursday," he says at last and because you know you're behaving badly; because you know you've had over two months and you haven't a leg to stand on, you haven't the courage either to be firm, and you say, "All right, Thursday then."

You know it won't be any good but it's a quarter to three and you haven't had any

lunch and if you don't slip out pretty quickly the pubs will be shut.

So you go....

But none of this is any guarantee at all that the next person who gives you *carte blanche* over the subject for an article won't find you just as eager to go right in up to the neck all over again.

After this we almost feel sorry for authors—until we remember what we have to go through. Life for us is one long series of broken promises and of manuscripts which may very well deal with snake-charming for all we can tell.

The trouble with the author of the above effort is that he had nothing to write about and, contrary to what he says in his last paragraph, he has told us that he will never, never, NEVER write another article. This is a pity because his articles (even when they are on lighting) are most readable.

However, we should hate intending authors to take this fragment too seriously. The strain of writing articles regularly is apparent, but the occasional article, when one has something to say, is not so difficult, and as our contributor was fired before he had had a chance to resign there is now more opportunity for other people to have their say—on matters of lighting.—ED.

SITUATIONS VACANT

ILLUMINATING ENGINEER required by Metropolitan-Vickers Electrical Co., Limited, London area. Preference given young man with National Certificate in Electrical Engineering. Apply, giving particulars, Lighting Section, 1-3, St. Paul's-churchyard, E.C.4.

DRAUGHTSMAN required with experience in coloured perspective drawings for electric light fittings manufacturers.—Write F. H. Pride, Ltd., 81, Clapham High-street, S.W.4.

LIGHTING ENGINEER required. Used to preparation Fluorescent Lighting Schemes. Must have full technical knowledge. Excellent prospects. London district. Replies treated in strict confidence.—Box AC 68037, Samson Clarks, 57-61, Mortimer-street, W.1.

SALES ENGINEER required by leading Industrial and Commercial Lighting Fittings Manufacturers to operate in territory covered by Merseyside and North Wales Electricity Board. Residence in or near Liverpool essential.—Reply in confidence, giving details of technical training, sales experience, past and present employment, etc., to Box No. 822.

A **LIGHTING ENGINEER** required for Malaya by old-established firm of Engineers-Merchants. Single man essential, I.E.S. Member preferred, capable of preparing schemes. Pension and bonus schemes.—Full particulars to Box No. 823.

COMMERCIAL ASSISTANT (25-30 years) required by large Company of Manufacturing Electrical Engineers in London. Applicants must be used to compiling estimates and preparing tenders. Knowledge of external lighting schemes and equipment advantageous. Pension scheme. Five-day week.—Write, stating age, experience, and salary required, to Box No. 824.

Wanted: **MANAGER** for well-known lighting fittings manufacturer (not E.L.F.A. member). Good all-round knowledge of this industry, with administration experience essential. Write, stating age, experience and salary required to Box No. 826

SITUATIONS WANTED

A.M.I.E.E. (51) SENIOR LIGHTING ENGINEER, full responsibility all classes of schemes and interviewing executives; wide electrical experience. Desires position Scotland.—Box No. 825.

Garden Lighting at Leamington

The lighting of many of our public parks and gardens during the Festival of Britain proved very popular and will no doubt be continued and extended in the future. The following describes one such installation at Leamington Spa.

Royal Leamington Spa, famed not only for its curative waters but also for its beautiful tree-lined roads and Regency buildings, added still further lustre to its enviable reputation as the result of the contribution it made to the Festival of Britain when, as a part of such contribution, the Corporation decided to illuminate the Jephson Gardens in which there are over fourteen acres of lawns. The East Midlands

Electricity Board were asked to act in an advisory capacity and, after the Festival Committee had agreed the general lay-out, the requisite equipment was either purchased or hired from a number of firms specialising in outdoor lighting, and the Board carried out the work of siting and installing it. The installation was switched-on on August Bank Holiday, and between that day and the end of September over 304,000 people—more than ten times the population of the borough—came from all parts of the country to see the spectacle. The installation consisted of fluorescent colour changing features, flowerbed lighting and festoon lighting and normal floodlighting. The



*Lighting of
the rockery
by small
coloured
fluorescent
lamps.*



The "Hampton Court" Fountains illuminated by lamps in under-water fittings.

following details give some idea of the magnitude of the project.

The main entrance to the Gardens is opposite the Royal Pump Room and Baths, and here 500-watt projectors, mounted on existing street lamps near the entrance gates, illuminated the lodges and adjoining flower beds. The basins of the Hitchman Fountain, now disused, were filled with soil and planted with flowers, the brilliant colours of which were shown to great advantage under blue fluorescent lamps and a festoon of tungsten lamps which surrounded the inner edge of the lower basin.

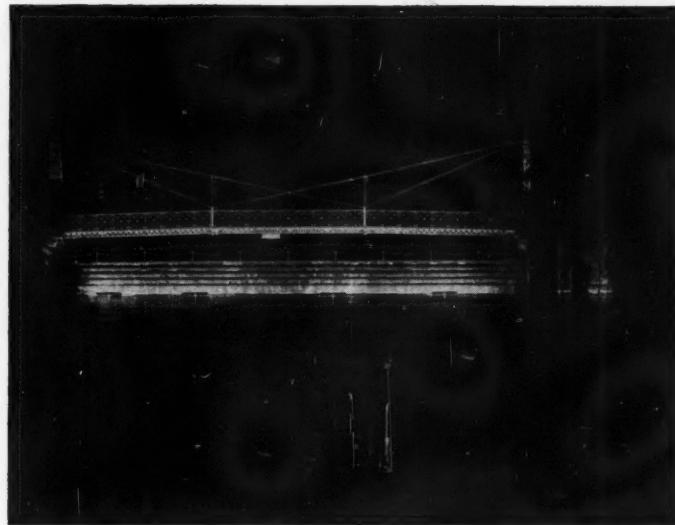
The flower beds on each side of the main walk leading up to the floral clock were illuminated by mushroom fittings placed in the centre of the beds whilst trough fittings were erected in suitable positions in the longer beds. Near the Jephson Memorial a set piece representing a peacock was erected, and this feature, which contained over 180 lamps, was so arranged that the tail of the peacock was made to flash in sequence. The statue of Dr. Jephson contained in the memorial bearing his name was lit from blue fluorescent lamps, whilst the outside of the dome was picked out in relief by ridge lighting concealed behind the cornice.

The lake was a particular source of attraction for an orchestra played on most

evenings in a specially constructed shelter on the island and the "Hampton Court" fountains glowed with ever-changing colour from fluorescent lamps mounted in under-water fittings. Plastic ducks and a porpoise—all illuminated internally—floated on the water of the lake.

Many hundreds of flowers had been planted in the hands and dial of the floral clock which was illuminated by tungsten-type floodlights placed at high level in surrounding trees. A nearby feature which was of particular interest to children were figures depicting scenes from nursery rhymes and illuminated by 80-watt fluorescent lamps in semi-circular troughs located at ground level. The dahlia beds were illuminated by small wattage fluorescent lamps mounted in special trough-type fittings. These troughs were about 6 ft. high and contained two compartments, the lower one housing four green lamps which threw a brilliant light on to the foliage of the dahlias whilst the upper compartment contained one pink lamp, a peach, a blue and a warm-white lamp, and the effect of this combination resulted in almost perfect colour rendering on the heads of the flowers. As a result of the troughs being placed in an upright position the spread of light was sufficient to give a

Showing the night - time view of the suspension bridge and weir.



diffused effect on the tops of the bushes at the rear of the beds.

From the Clock Tower along to the Willes Road entrance Chinese Lanterns were suspended from temporary poles, and similar type lanterns were used to illuminate the refreshment tents, shelters, etc. Coloured lamps in festoon and trough-type floodlights were dispersed amongst the trees and shrubbery on the Newbold Terrace side of the Gardens, whilst at this point there were a number of internally illuminated plastic animals and birds placed in and around the trees and bushes which were of particular interest to many of the younger visitors.

An automatic colour-changing floodlighting feature was installed to illuminate the trees and bushes at the Willes Road end of the Gardens. Each fitting contained one pink, one blue, and one green fluorescent lamp and the circuits were connected to three automatic dimming units which permitted a continuous colour-changing sequence. Connections were made in such a way as to permit the colour on the large cedar tree being in contrast to that on the surrounding bushes and trees and one very distinguished and much travelled visitor to the spectacle compared it with a Californian sunset.

In the Rockery on the north side of the

river frontage a waterfall was constructed and small coloured fluorescent lamps fixed to the rear of each step so as to shine through the water. Although not strictly a part of the Jephson Gardens the Suspension Bridge and Weir were illuminated by 1280-watt green fluorescent lamps placed in four semi-circular trough reflectors which were floated in an arc on the surface of the water below the Weir, whilst the floodgate towers at either end of it were picked out in white light from ordinary 500-watt projectors.

The Festival Committee, who inaugurated the scheme, and particularly Mr. J. W. Nunn, the Spa manager, received many congratulations on their enterprise. Over 12,000 lamps, having a total loading of approximately 200 kw., were used and nearly 18 miles of temporary wiring was used to connect them to four main supply points. The East Midlands Electricity Board acted as the contractors for the installation of the apparatus which was supplied by the General Electric Co., Ltd., Franco Signs, Ltd., the Simplex Electric Co., Ltd., "Beeantee" Illuminations (London), Ltd., and Thorn Electrical Industries, Ltd., to whom acknowledgment is made for the illustrations in this article.

I.E.S. ACTIVITIES

Informal Meeting in London

On November 28 a very successful informal meeting was held in London, when the Stockholm meeting of the International Commission on Illumination was the subject. The meeting also acted as a reunion for delegates and their wives from this country. A brief but very good and entertaining report on the technical session was given by Mr. C. W. M. Phillips, and the following are extracts from his remarks:

"When one remembers that the C.I.E. was originally established largely to discuss problems of photometric standardisation, it is interesting to note how far the work has extended to cover the whole field of lighting and seeing.

To my mind the most significant feature of the whole of the Stockholm meeting was the very large number of papers devoted in some way or other to a greater understanding of the act of seeing. Some 14 papers out of the 42 presented were directly related to seeing, and if some of them were a little too advanced for the practising lighting engineer they should serve as a stimulus to him to broaden his field of view of his subject. In this respect I most emphatically join issue with the Australian, Mr. Brentwood, who apparently wanted to see such matters as the subjective appraisal of brightness reduced to some selling slogan rather than to attempt to interpret for himself in his everyday lighting activity the results of this fundamental type of work.

In most countries the responsibility for designing lighting installations falls on members of commercial firms who must of necessity secure their living out of selling equipment, and I think it is true to say of Great Britain, at any rate, that practising lighting engineers are generally conscious of their responsibilities, but I do suggest that our Society might consider finding some way of ensuring close and constant collaboration between those engaged in fundamental research problems and those who practise in the field, so that at future C.I.E. meetings we can demonstrate leadership in applied practice.

I was particularly impressed by the relative harmony that now appears to exist

between the Americans, British and Dutch workers on problems of brightness, especially those involving the subjective approach.

Concluding this very brief review of the work of the Stockholm meeting devoted to various aspects of seeing and vision, I would commend to anyone who has the patience and time to explore in detail the 14 or so papers on this subject, and I venture to suggest that it might be found that one or more common threads run through the lot.

The sessions of the meeting devoted to practical lighting methods and problems were to some extent dominated by the magnificent report of the American Secretariat most excellently presented by Willard Brown.

The session on Store Lighting was significant to me in that hardly any of the illustrations in the report show the use of fittings as such. The tendency, especially in those countries which are not hampered like ourselves by the need to obtain licences for structural alterations and by the shortage of timber, is towards luminous elements designed to harmonise with prominent architectural features or to provide in themselves luminous architectural features of a dramatic and novel kind.

In the section of the Lighting Practice Report devoted to school lighting, it seemed to me that the Americans had progressed a great deal further than we have been able to do. The schoolroom is an ideal place to play about with brightness distributions, since they are a reasonably standardised size and shape.

Turning now to office lighting there seems to have been very considerable progress, particularly in the lighting of large general offices. Perhaps because the average Englishman is not a gregarious animal the tendency has been in designing office blocks to create a very large number of small rooms and the lighting engineer is frequently confronted with the fact that the wiring has already been embedded in the ceiling and there is one outlet available in the centre of the room. The tendency in America and other countries is towards the use of continuous lines of fittings and recent researches into acoustics have brought about a fairly general acceptance of

acoustically treated ceilings with lines of recessed louvred fluorescent units. I think we should again endeavour to secure closer co-operation between architects, builders, and lighting engineers, so that ceiling and lighting design can be considered as one problem.

The remaining important section of the lighting practice report covers industrial lighting, and here I think that we might have made a bigger contribution. It was interesting to hear that the use of upward light has just been discovered in the States, whereas, the principle of lighting the ceiling or roof became almost standard with us, probably due to our blacked-out factories.

In view of the world-wide shortage of industrial manpower it might be worth while suggesting devoting much greater time to the lighting of industry at the next meeting of the C.I.E.

The Definitions Sub-Committee had discussions in several languages and lamberls, stilbs, equivalent footcandles and whatever is the metric unit for brightness were thrown into the melting-pot and the resulting brew produced the 'nit.' I can hardly imagine the English-speaking world accepting the 'nit' as a unit of brightness with any considerable enthusiasm."

After this report a number of films which had been taken during the Stockholm meeting by members of the British delegation were shown by Mr. H. G. Campbell, Dr. Wellwood Ferguson, and Mr. Hunt, who showed some excellent colour films. Mr. Horner showed some colour stills.

After the meeting a party of 60 of the delegates to Sweden and a number of their ladies who were also at Stockholm went to a reunion dinner, organised by Dr. S. English, leader of the British delegation, and so concluded a most enjoyable evening.

Sessional Meeting in London

At the sessional meeting held in London on December 11 Dr. W. J. Wellwood Ferguson presented a paper entitled "Dark Adaptation and Miners' Nystagmus" in which the subject of the adaptation of the eye to very low levels of illumination was discussed, at first in general terms and then in particular reference to its connection with the condition known as miners' nystagmus. The methods adopted of measuring dark adaptation were described in some detail, and the method of expressing the course of adaptation graphically was explained. Diagrams were included showing the course of dark adaptation in a normal subject, and

contrasting this with the course of abnormal adaptation in subjects with varying retinal defects.

A brief description of miners' nystagmus followed. This is a condition found exclusively in coal miners, the average age of onset being from 40 to 50 years, that is, after working underground under conditions of low illumination for from 20 to 30 years. The outstanding physical sign, from which the condition derives its name, is an involuntary oscillation of the eyeballs. The frequency and severity of these oscillations vary considerably in individual cases, and from time to time in any one sufferer. In most cases they are aggravated by diminution of the illumination, and are at their worst in the dark, or by strenuous exercise, particularly exercise involving stooping. Other symptoms are photophobia (intolerance of bright light), blinking of the eyelids, difficulty in seeing in twilight or in the dark—coupled with increased sensitivity to glare—dizziness, and headache. In some cases these symptoms are followed by the development of a neurosis which is sometimes severe and may continue even after the oscillations of the eyes have disappeared. For this reason, the official description of the disease permits of a sufferer being certified as incapacitated thereby, even in the absence of the typical oscillations.

Extensive investigations of the condition, conducted by the Medical Research Council's Miners' Nystagmus Committee and more recently by researches sponsored by the Colliery Owners' Research Association and subsequently by the National Coal Board's Nystagmus Committee, have pointed to low illumination levels at the coal face as being the outstanding cause.

The complaint of some degree of night blindness prompted an investigation into the capacity for dark adaptation amongst coal miners, as contrasted with other workers in equivalent age groups, and amongst coal miners suffering from miners' nystagmus.

Tables showing the results of these investigations, conducted independently by Dr. Forbes Sharpley and the author, show that there is a deterioration in the capacity for dark adaptation in coal miners, as compared with control groups in other occupations. A further deterioration is present in miners suffering from nystagmus, as compared with non-nystagmics. It is suggested that the oscillations of the eyeballs are caused by the prolonged disuse of the cone vision (under

conditions where the illumination is usually below cone level) and represent an abnormal method of fixation similar to that seen in sufferers of congenital nystagmus, a condition which is present in those who from birth suffer from a bilateral lesion preventing macular vision.

The particular point of interest, from the illuminating engineering point of view, is that here there are a number of objectively visible or measurable signs of ocular disorder accompanying a condition ascribed to very low levels of illumination, as opposed to the more intangible and variable complaints of so-called eye-strain more commonly met with in connection with lighting problems.

Birmingham Centre

Members and visitors who attended the November Sessional Meeting of the Birmingham Centre had a most entertaining and instructive evening. The programme was devoted to the showing of some half-dozen films, all of which had a bearing on illuminating engineering. The success of the meeting can be gauged by the fact that practically all of the 140 people who attended stayed till the end.

Another notable function held by the

Centre on November 9, 1951, was the annual "Ladies' Night." This gay night out, which gets more popular year by year, began with a reception by the chairman, Mr. R. A. Lovell, and Mrs. Lovell. The rest of the evening was taken up with dancing and a most enjoyable time was had by everyone present. The whole thing was arranged by the secretary, Mr. W. J. P. Watson, and Mrs. Watson.

Nottingham Centre

The second meeting of the Nottingham Centre in the present session was held on November 1, when Mr. J. W. Morse presented a paper on Modern Airport Lighting. He dealt exhaustively with various systems of airport lighting as used for landing aircraft in conditions of low visibility and by night. Mr. Morse illustrated these methods by the use of diagrams and slides. At the completion of his paper he showed a colour film taken from the cockpit of a plane in the act of "homing" on its airport, to running in and touching down on the runway. The film gave a vivid impression of the pilot's viewpoint under most of the different lighting systems in use and the many variations which are applied for varying weather conditions.

Forthcoming Meetings

LONDON

January 8th

Sessional Meeting. "Lenses for Lighthouses," by W. M. Hampton. (At the Royal Society of Arts, John Adam Street, W.C.2.) 6 p.m.

January 23rd

Informal Meeting. Discussion on the Preparation of a Technical Paper. (At the Lighting Service Bureau, 2, Savoy Hill, W.C.2.) 6 p.m.

CENTRES AND GROUPS

January 2nd

SWANSEA.—"Sodium Lamps and their Application," by A. W. Gostt. (At the Minor Hall, Y.M.C.A., Swansea.) 6.30 p.m.

January 3rd

NOTTINGHAM.—"The Lighting of Modern Ocean Liners," by T. Catten. (At the Demonstration Theatre, East Midlands Electricity Board, Smithy Row, Nottingham.) 5.30 p.m.

EXETER.—"Neon Lighting," by C. Higgins. (At the Providence Hall, Northermhay Street, Exeter.) 7 p.m.

January 4th

BATH AND BRISTOL.—"Neon Lighting," by C. Higgins. (At the South Western Electricity Board Lecture Theatre, Old Bridge, Bath.) 7 p.m.

BIRMINGHAM.—"Modern Transport Lighting," by W. E. J. Drake. (Joint Meeting with the Institute of Road Transport Engineers.) (At the Imperial Hotel, Temple Street, Birmingham.) 6 p.m.

HUDDERSFIELD.—"The Use and Misuse of Fluorescent Lighting," by T. C. Holdsworth. (At the Electricity Showroom, Market Street, Huddersfield.) 7.15 p.m.

January 8th

LIVERPOOL.—"Brightness Engineering," by W. Robinson. (At the Lecture Theatre, Merseyside and North Wales Electricity Board's Service Centre, Whitechapel, Liverpool.) 6 p.m.

January 9th

EDINBURGH.—"Measurement of Light in the 18th Century" by H. Buckley. (At the Welfare Club Hall, City of Edinburgh Lighting and Cleaning Dept., 357, High Street, Edinburgh.) 7.30 p.m.

NEWCASTLE.—"Development of the Tungsten Lamp," by B. P. Dudding. (At the New Theatre, Pilgrim Street, Newcastle-on-Tyne.) 6.15 p.m.

January 10th

GLASGOW.—"Development of the Tungsten Lamp," by B. P. Dudding. (At the Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, C.2.) 6.30 p.m.

MANCHESTER.—Members' Night. (At the Demonstration Theatre, Manchester Town Hall Extension.) 6 p.m.

January 16th

TEE-SIDE.—"The Design of Lighting Fittings," by S. S. Beggs. (At the Cleveland Scientific and Technical Institution, Corporation Road, Middlesbrough.) 6.30 p.m.

January 17th

GOULCESTER AND CHELTENHAM.—"Lighting on the Queen Elizabeth and the Caronia," by T. Catten. (At the General Electric Co., Ltd., St. Aldgate Street, Gloucester.) 6.15 p.m.

LEICESTER.—Film and Discussion Evening. (At the Demonstration Theatre, East Midlands Electricity Board, Charles Street, Leicester.) 6.30 p.m.

January 21st

SHEFFIELD.—"Stage Lighting," by P. Corry. (At the Lecture Hall, Surrey Street Library, Sheffield.) 6.30 p.m.

January 24th

BRADFORD.—"Church Lighting," by L. C. Rettig. (At the Yorkshire Electricity Board, 45-53, Sunbridge Road, Bradford.) 7.30 p.m.

January 28th

LEEDS.—"Television in Yorkshire," by J. T. Thornton. (Joint Meeting with the Electrical Association for Women.) (At the Lighting Service Bureau, 24, Aire Street, Leeds, 1.) 7 p.m.

January, 1952

LIGHT AND LIGHTING

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POSTSCRIPT

By "Lumeritas"

Since I referred last month to the difficulty of seeing "Zebra" crossings at night, further adverse comments have appeared in the daily Press, and questions have been asked in the House concerning the value of these crossings and the need for lighting them at night. The misuse of the crossings by some pedestrians who have not the sense to understand that motor vehicles need more than a yard or so in which to come to rest from a moderate speed has led to accidents on crossings even in broad daylight; I have witnessed one myself. A tour of one London borough has convinced me that the crossings cannot be seen from an approaching car on a wet night. So far I have noticed illuminated beacons at one crossing only, and I doubt if they will prove sufficiently conspicuous markers in thoroughfares where there are numerous other lights. The Minister of Transport has said that methods of revealing the crossings to road users at night are being tried, and it is to be hoped that a satisfactory solution of this problem of lighting will soon be found. The Twickenham Road Safety Vigilantes' Association has suggested the use of flickering amber warning lights in advance of traffic signal lights on high-speed roads. I think such flickering lights might be used to better purpose at "Zebra" crossings.

The recent shocking tragedy at Chatham, when 23 boys were killed by a bus and 19 others were injured, has drawn attention to the poorness of the lighting of the street in which the tragedy occurred. At the time of writing, the inquiry into the causes of this fearful road accident has not been completed, and it would be improper to attempt to anticipate the findings. But, according to Press reports, the street lighting is notoriously bad and it has been the subject of complaints for a long time. Of course, the lights carried by vehicles should be adequate for drivers travelling at reasonable speeds to see in good time what obstacles they are approaching, even if there is no street lighting. Nevertheless, bad lighting in town streets used by public transport vehicles should be rectified as soon as possible.

I have recently had the opportunity of measuring the illumination (as provided by artificial lighting) on the desks in a series of modern city offices occupied by high-ranking business executives. Believe it or

not, the photometer readings were all within the range 1.5 to 3 lm./ft.². How prevalent this state of affairs now is in offices I cannot guess, but when the long-awaited report of the Building Research Board's Committee on Office Lighting is published, perhaps it will contain statistics of current practice. Bob Cratchit, with a single candle in his "dismal little cell" annexed to Scrooge's counting-house, had not much less light on his desk than I found in these comparatively palatial offices in this year of grace. Yet their occupants are not much concerned to keep down the cost of lighting and, unlike Scrooge, they do not like darkness because it is cheap. But it is surprising for how long some people will put up with poor lighting before realising how much they are handicapped and discomfited by it.

If the reverend gentleman who thought how complicated life is becoming when he read the definition of "lumen" in the School Premises Regulations would peruse the definitions included in the Official Recommendations of the International Commission on Illumination he would doubtless say how right he was! He would find, for instance, that "Illumination (at a point of a surface) is the ratio of the luminous flux incident on an infinitesimal element of surface containing the point under consideration, to the area of this element." Then he would find that, if the words "emitted from" are substituted for "incident on" in the foregoing definition, "luminous emittance (from a point of a surface)" is defined. He would find that the unit for each of these quantities is the lumen per unit area, and perhaps he would wonder why, if we speak of "luminous emittance," we do not make life still more complicated by speaking of "luminous incidence" instead of "illumination"—which is so non-technical! He would, however, find no mention of an *artificial* light source in the definition of "lumen," but, instead, a reference to a source that is only an idea in the mind of the photometrist. As for "candela," he might guess it derives from "candle," yet wonder why, if "candle" is an inappropriate name for the unit of luminous intensity, the Latin root common to numerous lighting terms is not consistently used by constructing a suitable word, like "luten."

